CASE STUDY: Sustainable Building

INFORMATIONAL SUPPLEMENT FOR DCLU CUSTOMERS

south lake union

sustainable development in an urban environment

The May 2003 issue of dcluINFO *featured a case study on the City's newest green building, the Seattle Police Department's Southwest Precinct. This month's feature highlights the "Resource Guide for Sustainable Development," which recommends strategies for reducing the environmental impact of development in the South Lake Union Neighborhood.*

In order to identify sustainable design and technology solutions for the South Lake Union Neighborhood (pictured above), a "Resource Guide for Sustainable Development" has been created for use by both the private and public sectors. The Guide was sponsored by Vulcan Inc. and prepared by the Urban Environmental Institute.

In order to identify sustainable design and technology solutions for the South Lake Union (SLU) neighborhood, a "Resource Guide for Sustainable Development" has been created for use by both the private and public sectors to promote urban livability and quality of life, preserve the historic fabric, and strengthen the local economy.

The guide was sponsored by Vulcan Inc. and prepared by the Urban Environmental Institute (UEI), a local non-profit that creates innovative solutions to environmental challenges. UEI brought together a consultant team including Mithun, Arup Engineers, 2020 Engineering, ValueMiner, and Built-e to identify design and technology solutions appropriate for SLU that would be "repeatable" within the larger development community.

At the building level, the LEED™ Green Building Rating System was recommended as both a benchmark and performance measurement tool. LEED™ provides criteria in five environmental categories: site, water, energy, materials, and indoor environmental quality. The Guide grouped recommendations into these categories. All recommendations are specific to the Pacific Northwest climate and economic conditions and were evaluated based on the overall economic, environmental and social benefits.

> ***"We required the team to develop recommendations that would be 'repeatable' within the larger development community"***
>
> *—Hamilton Hazlehurst, Real Estate Development Manager, Vulcan*

Of the 370 acres in the SLU Planning Area, the City owns or controls nearly 34%, or 125 acres, dedicated to the public right of way. Seattle's Comprehensive Plan, "Toward a Sustainable Seattle," communicates the City's vision and lays the foundation for transformation. The primary strategy of the Comprehensive Plan is to create a connected network of urban

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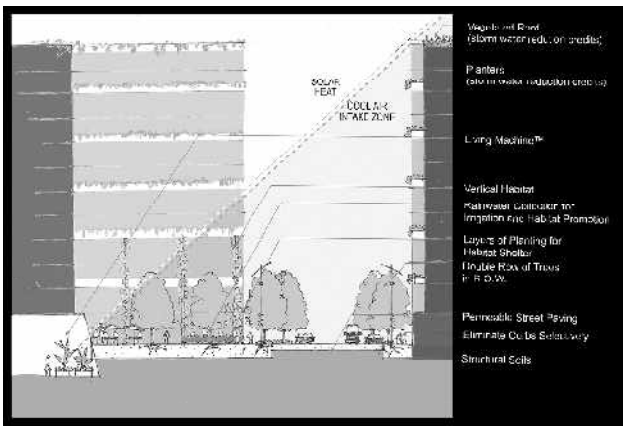
villages. Urban villages meet the City's goal of maintaining Seattle's character and single-family neighborhoods, while enhancing livability by creating transit oriented and pedestrian friendly mixed-use neighborhoods. Land use code development, zoning, and investments in infrastructure are the three primary tools that the City will use to manage growth and realize our shared vision for the future.



Street section illustrates integrated strategies that reduce stormwater runoff and energy required to meet cooling loads, while simultaneously making sustainability visible.

Illustration courtesy of Mithun

Recommended Strategies

The Guide offers recommendations for land use planning, zoning, and infrastructure development that are based on the principles of sustainability. The strategies suggest that we harness natural resources to optimize building performance and enhance quality of life in a community, including:

- the sun for light, heat and energy;
- the wind for fresh air and cooling during the summer;
- plants to cleanse the air, cool surrounding areas, and provide habitat for a diversity of species; and
- water conservation and reuse, to make the most of a limited resource.

A few of the nearly 40 recommendations made in the Guide are featured below.

1. Make Sustainability Visible: Making sustainability visible is an important strategy to raise awareness in the broader community and create cultural change. It also provides both a marketing opportunity for the neighborhood and a constant reminder of our journey towards sustainability by reconnecting us to nature and the wonder of natural systems.

One of Mayor Nickels' stated goals is to "restore ecological function and promote environmental justice through more sustainable approaches to managing the built environment, urban forest, and green space." The Mayor has launched an environmental stewardship and education program in summer camps at the City's parks.

The City can extend this program by making sustainability visible, and creating signage and educational materials that explain sustainable design and technology solutions implemented in Seattle's buildings, parks, rights-of-way and infrastructure developments.

2. Improve Transportation Choices: The Guide promotes strategies that improve transportation choices and increase flexibility for meeting parking requirements. Considering parking at the building, block/multi-block and neighborhood scales, the alternatives include: buddy parking agreements between colleagues; shared parking between uses such as commercial and residential; carpooling programs or a "Flexcar" vehicle sharing program; and planning for "peak load events" with a diversity of strategies such as shared parking on a multi-block scale, valet parking, or parking in flexible use areas.

The City's minimum requirement for parking is defined in the Seattle Land Use Code, Ch. 23.54, "Quantity and Design Standards for Access and Off-

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street Parking," and DCLU Director's Rule 14-2002, "Transportation Management Programs." These regulations offer flexibility and a menu of strategies for reducing parking requirements including some of the alternatives identified in the Guide. However, an opportunity may arise to reward innovative approaches by increasing flexibility within the code and extending the Director's Rule to the South Lake Union neighborhood for projects that develop and implement a performance-based transportation management plan and clearly demonstrate a reduced need for parking.

"The Guide recommends harnessing natural resources—the sun, wind, plants and water— to optimize building performance and enhance quality of life."

—Lynne Barker, DCLU Sustainable Building Specialist

3. Practice Restorative Redevelopment: The Guide identifies a number of strategies that address ecological function. For example, vegetated roof systems reduce peak flows of stormwater and reduce ambient temperatures caused by solar heat gain on roofs. This in turn reduces the energy needed to meet cooling loads, creates habitat for birds, and provides an amenity for building occupants.

During large storm events stormwater runoff from South Lake Union, Queen Anne, and Capital Hill predominantly flows into storm sewers that discharge directly into Lake Union. The combined sewer system overflows and drains untreated sewage into the lake. Strategies that reduce peak flows of stormwater and serve multiple functions include: installing vegetated roof systems, creating a "big tree neighborhood" with large double rows of canopy trees; installing green space in the public right of way; landscaping with native and adapted plants; installing porous pavements; and collecting and reusing stormwater.

While these strategies primarily reduce stormwater flows, they also serve to enhance the aesthetic quality of the neighborhood, reduce potable water use, conserve energy by reducing ambient temperatures, offset CO^2 emissions, recharge groundwater, and filter and cleanse water before it reaches Lake Union. The strategies support the Mayor's sustainable infrastructure initiative, and may be implemented through existing programs such as the Street Improvement Manual, Green Streets and the Blue Ring, and the Natural Drainage Program. Greening the City's infrastructure will enhance the public right-of-way by transforming our streets, sidewalks and parks, and restore the ecological function to the watershed.

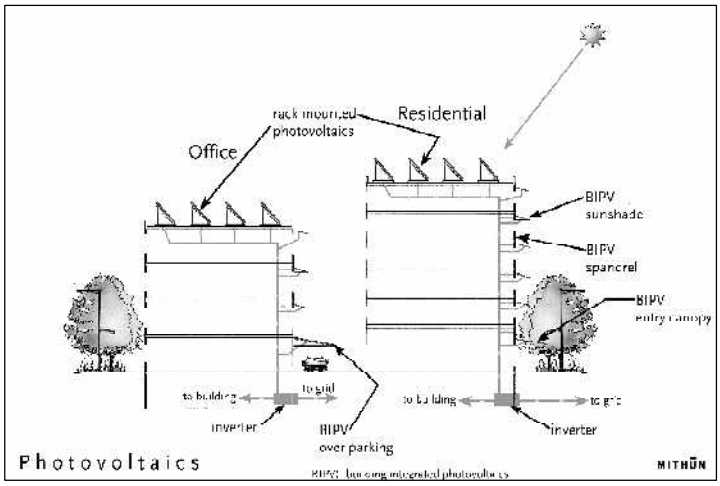

Illustration shows the diversity of photovoltaic products available in today's marketplace, including building integrated photovoltaics.

Illustration courtesy of Mithun

4. Achieve Carbon Neutrality: In 2000, the Mayor and City Council adopted a climate change policy that requires Seattle City Light meet an increase in demand for energy with no net greenhouse gas emissions. In order to achieve this goal the City must reduce overall energy use, utilize renewable energy sources to meet an increase in demand, and offset any

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increase in emissions.

The primary recommendation to significantly reduce energy use in buildings is to adopt a passive design strategy, starting with the basics of orientation, massing, siting, natural ventilation, thermal storage, and vegetation. Seattle's temperate climate is ideal for this approach. To optimize performance, passively designed buildings must have a southern orientation to control for solar gain, minimized building depth for cross ventilation, and increased floor to ceiling heights to facilitate natural displacement of air (hot air rises). These strategies serve multiple functions by providing the foundation for a superior indoor environment. When integrated and designed well they enhance health and productivity by providing fresh air, daylight, views, and a connection to nature.

Seattle's Land Use Code establishes height limits within specific zones, and does not allow developers the flexibility to make trade-offs between the building layout and massing and building height. Developers typically maximize the footprint to meet market-driven economic goals. As we look to the future, there may be an opportunity to increase flexibility in the Code that considers orientation, form, and performance to support broader environmental community goals.

The Guide also recommends the use of distributed photovoltaic (PV) systems to generate at least 10% of total energy demand for the neighborhood. PV's may only make sense if the City provides an incentive to help defray the increase in capital costs, in addition to the state and federal government tax incentives for PV installations. The City may receive benefit by reducing infrastructure costs for energy delivery, strengthening our economic development strategy to attract renewable energy companies and sustainable industries, and creating a market identity for Seattle as a leader in sustainability.

5. Build a Brand for Green Building and Sustainability: A unique strategy that fell outside of development was to establish a brand for green buildings and sustainability. A brand will create value for green buildings and sustainability in the marketplace, and help people make the connection between sustainable strategies and their values. Local developers who are embracing sustainability asked the City to help them create such a brand, which will result in a market preference for green buildings, and will target the real estate and finance communities.

DCLU has taken on this challenge and will help to educate the real estate sector so that they can communicate the benefits of green buildings. The City will also educate the financial sector to help them understand that green buildings are a superior investment.

Additionally, the City is working with local partners to develop an integrated marketing and communications program that will result in more demand for green buildings and help customers make the connection between green buildings and their values such as access to natural daylight, fresh air and views, healthy living and working environments, livability, and environmental stewardship. The program is currently under development and will be launched this year.

Building integrated photovoltaics implemented in Oberstufenzentrum II, an Arup project in Frankfurt, Germany.

Photo courtesy of Arup

Additional Resources

To learn more about the "Resource Guide for Sustainable Development," visit **www.mithun.com/expertise/resourceguide.pdf**. For more information on LEED™ visit **www.usgbc.org.**

To learn more about Seattle's Sustainable Building Program, visit their website at **www.seattle.gov/sustainablebuilding**. And to explore DCLU's role in sustainable building, visit **www.seattle.gov/dclu/sustainability** or contact:

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